National Cancer Institute

caBIG cancer Biomedical Informatics Grid®

21st Century Imaging Enabled by caBIG®

Dr. Eliot Seigel
It's really important for me, as a radiologist, to be able to not only access my own cases and my own database, but to have the capability of being able to access images from some of the other best hospitals and best radiology practices in the world.

Paul Mulhern
caBIG® provides the opportunity for researchers to use standards-based methods to create, save, classify, store, retrieve and mine medical data, specifically medical imaging data. Right now, caBIG® imaging tools are being used at some of the leading academic medical centers, including Washington University, Emory University, Ohio State University and Stanford University. caBIG® imaging tools are also being used within the National Cancer Institute at the Cancer Imaging Program.

Mike Tilkin
One of the caBIG® activities, AIM—Annotated Imaging Markup—is really about capturing the process of marking up an image, of highlighting regions of interest, measuring, and storing that data in standard formats. And it's those types of efforts that then allow clinicians, researchers, to leverage this information.

Dr. Eliot Seigel
What we have has completely reinvented the way that we do radiology reporting, in this case for brain tumors, by pulling up an image from the National Biomedical Imaging Archive, bringing it to the workstation, visualizing the tumor, drawing a region of interest around the perimeter of the tumor, saving that, bringing up a template, and then subsequently filling out that template, saving the data to an AIM data service, and then making that data available to researchers around the world.

Paul Mulhern
Correlative studies are valuable at the research level because what you want is as many different data types as possible and to be able to ask questions across those data types. If you have genomic profiles and you're able to associate certain genomic profiles with certain outcomes from certain types of cancer, those

findings are much more powerful if you have imaging interpretation data to back it up, along with the clinical data that tells you the outcome, the treatments that were given and the outcomes that occurred from those treatments.

What you need to enable these studies, caBIG® provides in two important ways. One provides technology that enables people to implement standards across a large scale. What caBIG® also does, and what maybe is ultimately harder and more important, is building a community of people of diverse stakeholders to agree on standards, to agree on terms that mean the same thing and to use them in a similar fashion for the greater good

Mike Tilkin
At the end of the day, this really means a better quality of care. It means earlier diagnosis, it means the ability to leverage broader data sets.

Dr. Eliot Seigel
Multi-modality fusion has really changed the way that we've practiced diagnostic radiology because what we have now is the capability to take functional information and combine it with anatomic information.

And it's really important that we have tools that are available at the workstation to allow a radiologist to change from being a passive recipient of individual images to an active navigator through very complex data sets, through increasingly sophisticated workstations, using tools such as the ones that have been developed for the caBIG® Imaging Workspace.

Mike Tilkin
So as we look to accelerate drug discovery and improve patient outcomes, there are a lot of new or exciting technologies that come into play. Molecular imaging is a good example.

Dr. Frank Sauer
Molecular imaging is a very interdisciplinary field. caBIG® has started to bring different communities together and helped to make the different researchers in this community able to exchange data, exchange tools and, in a way, really focus on creating this extra value moving the knowledge and the research further.

You can use the tools that are created in caBIG® to import these images, to analyze these images, to create results based on these images; and that's the power of having a standard platform.

Gianluca Paladini

XIP, the eXtensible Imaging Platform, is a reference implementation of the DICOM Working Group-23 emerging standard for application hosting.

XIP helps researchers develop applications throughout all the phases of their R&D work. First, during the early stages of research when developing algorithms, XIP provides a visual predominant environment that promotes modularity and reusability of algorithms. Secondly, it provides a reference implementation of the application-hosting standard so that they can develop plug-in applications that can be easily deployed on any vendor's machine without having to be reimplemented again and, therefore, accelerating the time to market and the time that clinical applications enter actual clinical use.

Dr. Eliot Seigel

The whole purpose and vision that we have is to allow for a present and a future in which radiologists have the capability of being able to have as much information as possible available from institutions all across the country.

Interviewees

Dr. Eliot Seigel
Professor of Diagnostics Radiology and Nuclear Medicine
University of Maryland

Paul Mulhern
Workspace Lead
caBIG® Imaging Workspace

Mike Tilkin
Chief Information Officer
American College of Radiology

Dr. Frank Sauer
Imaging and Visualization Department Head
Siemens Corporate Research

Gianluca Paladini
Imaging and Visualization Program Manager
Siemens Corporate Research

For more information please visit www.cabig.cancer.gov/.